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NASA, NOAA AND AEROSONDE TEAM UP ON HURRICANE OBSERVATION MILESTONE

NASA, NOAA and Aerosonde North America teamed up to mark a new milestone in hurricane observation on Sept. 16 as an unmanned aircraft flew into Hurricane Ophelia. The aircraft, known as an Aerosonde, provided the first ever detailed observations of the near-surface, high wind hurricane environment, an area often too dangerous for manned aircraft to observe directly.

"The air-sea interface is a critical area for hurricane dynamics, yet we have little data there because of the dangerous environment. I'm thrilled that our partnership with NOAA and Aerosonde led to this successful mission," said Cheryl Yuhas, manager of the Suborbital Science program at NASA Headquarters, Washington. "We were not only able to collect a unique low-level dataset for hurricane researchers, but together we also demonstrated the potential for a future operational capability."

The Aerosonde was launched from NASA's Wallops Flight Facility, Wallops Island, Va., on Sept. 16. Wallops provided basing and pre-mission validation and testing of the unmanned aircraft and its support systems prior to its deployment into the storm. In addition, NASA and Aerosonde staff monitored and controlled the flight from Wallops.

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"The concept of the Aerosonde as a small, robust unmanned autonomous vehicle, or UAV, arose directly from our need for observations in dangerous areas such as the hurricane surface layer," said Greg Holland, president of Aerosonde North America and one of the Aerosonde originators.

The successful use of satellites and aircraft have been important tools in the arsenal to understand tropical cyclones. Detailed observations of the near-surface hurricane environment have been elusive because of the severe safety risks associated with low level manned flight missions. The main objective of the Aerosonde project addresses this significant observational shortcoming by using the unique long endurance and low-flying attributes of the unmanned Aerosonde observing platform, flying at altitudes as low as 500 feet. NASA pioneered the use of Aerosondes in earlier tropical convection experiments in 2001 and 2005, but this was the first time the Aerosonde actually flew into a hurricane. Ophelia provided the perfect test case as it was a minimal hurricane within flight range of Wallops.

"It's been a long road to get to this point, but it was well worth the wait," said Joe Cione, NOAA hurricane researcher at the Atlantic Oceanographic and Meteorology Laboratory (AOML) in Miami and the lead scientist on this project. "If we want to improve future forecasts of hurricane intensity change we will need to get continuous low-level observations near the air-sea interface on a regular basis."

The Aerosonde platform that flew into Ophelia was specially outfitted with sophisticated instruments used in traditional hurricane observations, including instruments such as mounted Global Position System (GPS) dropwindsonde and a satellite communications system that relayed information on temperature, pressure, humidity and wind speed every half second in real-time. The Aerosonde also carried an infrared sensor that was used to estimate the underlying sea surface temperature.
All available data were transmitted in near-real time to the NOAA National Hurricane Center and AOML.

The environment where the atmosphere meets the sea is critically important in hurricanes as it is where the ocean's warm water energy is directly transferred to the atmosphere just above it. The hurricane/ocean interface also is important because it is where the strongest winds in a hurricane are found. Observing and ultimately better understanding this region of the storm is crucial to improve forecasts of hurricane intensity and structure. Enhancing this predictive capability would not only save the U.S. economy billions of dollars, but more importantly, it could save many lives.

For more information on other NASA hurricane research projects on the Web, visit:

http://www.nasa.gov/vision/earth/lookingatearth/hurricane_2005.html

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